



NSAI
Standards

Irish Standard
I.S. EN 61988-2-1:2012

Plasma display panels -- Part 2-1:
Measuring methods - Optical and
optoelectrical (IEC 61988-2-1:2012
(EQV))

I.S. EN 61988-2-1:2012

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 61988-2-1:2002 EN 61988-2-2:2003	<i>This document is based on:</i> EN 61988-2-1:2012 EN 61988-2-1:2002	<i>Published:</i> 9 March, 2012 18 December, 2002
This document was published under the authority of the NSAI and comes into effect on: 14 March, 2012		ICS number: 31.260
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

English version

**Plasma display panels -
Part 2-1: Measuring methods -
Optical and optoelectrical
(IEC 61988-2-1:2012)**

Panneaux d'affichage à plasma -
Partie 2-1: Méthodes de mesure -
Mesures optiques et opto-électriques
(CEI 61988-2-1:2012)

Plasmabildschirme -
Teil 2-1: Messverfahren – Optisch und
opto-elektrisch
(IEC 61988-2-1:2012)

This European Standard was approved by CENELEC on 2012-02-28. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

I.S. EN 61988-2-1:2012

EN 61988-2-1:2012

- 2 -

Foreword

The text of document 110/337/FDIS, future edition 2 of IEC 61988-2-1, prepared by IEC TC 110, "Flat panel display devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61988-2-1:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-11-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-02-28

This document supersedes EN 61988-2-1:2002 and EN 61988-2-2:2003.

EN 61988-2-1:2012 includes the following significant technical changes with respect to EN 61988-2-1:2002:

– EN 61988-2-1:2002 and EN 61988-2-2:2003 were combined and reconstructed in this document.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61988-2-1:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61988-2-1	NOTE Harmonized as EN 61988-2-1.
IEC 61988-2-2	NOTE Harmonized as EN 61988-2-2.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60107-1	-	Methods of measurement on receivers for television broadcast transmissions - Part 1: General considerations - Measurements at radio and video frequencies	EN 60107-1	-
IEC 61988-1	-	Plasma display panels - Part 1: Terminology and letter symbols	EN 61988-1	-
IEC 62087	-	Methods of Measurement for the power consumption of audio, video and related equipment	EN 62087	-
CIE 15	-	Colorimetry	-	-

This page is intentionally left BLANK.

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Structure of measuring equipment	7
5 Standard measuring conditions.....	7
5.1 Environmental conditions	7
5.2 Set-up conditions	7
5.2.1 General	7
5.2.2 Measuring layout	8
5.2.3 Field frequency.....	8
5.2.4 Adjustment of PDP modules	9
5.2.5 Warm-up condition of PDP modules	9
5.3 Lighting conditions	9
5.3.1 Dark-room conditions	9
5.3.2 Bright-room conditions.....	9
6 Measuring methods	11
6.1 Measuring methods of 4 % window luminance	11
6.1.1 Purpose.....	11
6.1.2 Measuring equipment	11
6.1.3 Measurement.....	11
6.2 Measuring method of luminance uniformity	12
6.2.1 Purpose.....	12
6.2.2 Measuring equipment	12
6.2.3 Measurement.....	12
6.3 Measuring method of dark-room contrast ratio.....	13
6.3.1 Purpose.....	13
6.3.2 Measuring equipment	13
6.3.3 Measurement.....	14
6.4 Measuring method of bright-room contrast ratio 100/70	15
6.4.1 General	15
6.4.2 Purpose.....	15
6.4.3 Measuring equipment	15
6.4.4 Measurement.....	15
6.5 Measuring method of white chromaticity and chromatic uniformity	16
6.5.1 Purpose.....	16
6.5.2 Measuring equipment	16
6.5.3 Measurement.....	16
6.6 Measuring method of colour gamut.....	17
6.6.1 Purpose.....	17
6.6.2 Measuring equipment	17
6.6.3 Measurement.....	17
6.7 Measuring method of module power and current consumption	18
6.7.1 Purpose.....	18
6.7.2 Measuring equipment	18
6.7.3 Measurement.....	19

6.8	Measuring method of module power consumption using video signal.....	21
6.8.1	General	21
6.8.2	Measuring equipment	21
6.8.3	Applied digital video signal	21
6.8.4	Image processing board	21
6.8.5	Measurement.....	22
6.9	Measuring method of module luminous efficacy.....	23
6.9.1	Purpose.....	23
6.9.2	Measuring equipment	23
6.9.3	Measurement.....	23
6.10	Measuring method of panel luminous efficacy	24
6.10.1	Purpose.....	24
6.10.2	Measuring equipment	24
6.10.3	Panel conditions	25
6.10.4	Driving waveform.....	26
6.10.5	Applied display patterns	27
6.10.6	Measurement.....	27
Annex A (informative) Clause cross-references from the previous edition of IEC 61988-2-1:2002 and IEC 61988-2-2:2003 to IEC 61988-2-1:2011.....		31
Bibliography.....		33
Figure 1 – Measuring layout (side view).....		8
Figure 2 – Example of bright-room conditions		10
Figure 3 – 4 % window luminance measuring pattern		11
Figure 4 – Measuring points.....		13
Figure 5 – Minimum luminance measuring pattern		15
Figure 6 – Example of the colour gamut measurement.....		18
Figure 7 – Example of power and current measuring diagram		19
Figure 8 – System diagram of sustain power measurement.....		25
Figure 9 – Driving system and waveform.....		27
Table 1 – Example of luminance uniformity measurement.....		13
Table 2 – Example of chromaticity measurement		17
Table 3 – Example of power and current measurements (for a module that includes an AC input)		20
Table 4 – Example of power and current measurement (for a module with DC inputs only)		20
Table 5 – Example of measurement results of module power consumption using video signal.....		22
Table A.1 – Clause cross-references.....		32

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLASMA DISPLAY PANELS –

Part 2-1: Measuring methods – Optical and optoelectrical

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61988-2-1 has been prepared by IEC technical committee 110: Electronic display devices.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- The first edition of IEC 61988-2-1 and IEC 61988-2-2 were combined and reconstructed in this document.

The text of this standard is based on the following documents:

FDIS	Report on voting
110/337/FDIS	110/352/RVD

Full information on the voting for the approval on this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61988 series, under the general title *Plasma display panels*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

PLASMA DISPLAY PANELS –

Part 2-1: Measuring methods – Optical and optoelectrical

1 Scope

This part of IEC 61988 determines the following measuring methods for characterizing the performance of plasma display modules (PDP modules):

- a) four per cent (4 %) window luminance;
- b) luminance uniformity;
- c) dark-room contrast ratio;
- d) bright-room contrast ratio 100/70;
- e) white chromaticity and chromatic uniformity;
- f) colour gamut in the centre box;
- g) module power and current consumption;
- h) module power consumption using video signal;
- i) module luminous efficacy, and
- j) panel luminous efficacy.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1, *Environmental Testing – Part 1: General and guidance*

IEC 60107-1, *Methods of measurement on receivers for television broadcast transmissions – Part 1: General considerations – Measurements at radio and video frequencies*

IEC 61988-1, *Plasma display panels – Part 1: Terminology and letter symbols*

IEC 62087, *Methods of measurement for the power consumption of audio, video and related equipment*

CIE 15:2004, *Colorimetry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61988-1, IEC 60068-1, and IEC 60107-1, as well as the following, apply.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-